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AUTHOR Lovano-Kerr, Jessie
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ABSTRACT

This paper briefly reviews the concept of cognitive style and then analyzes Witkin's theory on Psychological Differentiation, examining its possible use for research in art education. Cognitive style refers to individual differences in the processes by which knowledge is acquired. According to Witkin's Psychological Differentiation theory, "Field-Independent" (FI) persons are more likely to use internal referents as primary guides in information processing, and "Field-Dependent" (FD) persons use more external referents. For example, FI persons have an internalized frame of reference as a guide to self-definition. They use themselves as referents. FD persons, on the other hand, require externally defined goals and reinforcement. A list of the most basic characteristics and behaviors of FD and FI persons is provided. Inferences regarding these behaviors and their manifestations in art processes are then made, and suggestions for future areas of research in art education are recommended. For example, FD individuals tend to excel in interpersonal and social competencies as compared to FI persons. These social tendency orientations have implications for art education. One question for study might be: To what extent does social tendency orientation affect choice of subject matter, mode of expression, and approach to problem solving? (RM)

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COGNITIVE STYLE REVISITED: IMPLICATIONS FOR RESEARCH IN ART PRODUCTION AND ART CRITICISM

Jessie Lovano-Kerr
Professor of Art Education
School of Education
Indiana University
Bloomington, Indiana 47405

American Educational Research Association
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Abstract

The study of the nature of individual differences in cognition has been a sustained focus of many researchers in cognitive psychology. A number of theories have been developed. Among these is the Psychological Differentiation Theory developed by Herman Witkin and his colleagues. This paper explicates his theory, identifies the strengths and weaknesses of his constructs in relation to art production and art criticism, relates behaviors characteristic of his field-dependent/field-independent dimensions to artistic behaviors, and derives implications for research on artistic development from this analysis and from recent studies in art education.

Introduction

The study of the nature of individual differences in cognition has been a sustained focus of many researchers in cognitive psychology and related fields. In particular, this research activity for the past 30 years has resulted in the development of a number of cognitive style constructs, some of which have been central to the study of learning and instruction. The implications and potential of cognitive style research for use in art educational inquiry and practice are worthy of closer scrutiny and examination.

This paper will (1) review briefly the construct of cognitive styles, its definitions and construct variations, and its common attributes across styles; (2) discuss Witkin's theory on Psychological Differentiation, of which cognitive styles are a basic construct; (3) indicate some of the weaknesses of Witkin's theory; (4) identify behaviors characteristic of each of his cognitive style dimensions and relate them to artistic behaviors; and (5) derive implications for research on artistic development from this analysis and from recent studies in art education.

Cognitive Style Definition and Dimensions

In general, the concept of cognitive style refers to psychological dimensions that represent consistencies in an individual's mode of processing and acquiring information. More specifically, "it concerns individual differences in the processes of cognition, which generally include all processes by which knowledge is acquired: perception, thought, memory, imagery in the 'picture-in-the-mind' sense defined by Fleming (1977), and problem solving. The notion of variations in style of cognition implies more than degrees of skill or ability in these cognitive processes; it implies the existence of individual differences and preferences in actual modes or manners of gaining, storing, processing, and using information as well. There is thus a qualitative, as well as a quantitative, variation in mental functioning that underlies the concept of cognitive styles." (Ausburn and Ausburn, 1978, p. 338).

Although there is general agreement as to the definition of cognitive style, there is not a similar consensus as to its dimensions. The concept of cognitive style has not been studied as a single entity. Rather, a number of different dimensions have been

identified and subjected to systematic theoretical and empirical examination (Ausburn & Ausburn, 1978).

At least eleven cognitive style dimensions have been the subject of considerable investigation and appeared with some regularity in the literature since their original formulation: field independence/field dependence (Witkin, Dyk, Faterson, Goodenough & Karp, 1962; Witkin, Goodenough & Oltman, 1979), scanning/focusing (Gardner, Holzman, Klein, Linton & Spence, 1959; Schlesinger, 1954), breadth of categorizing (Kogan & Wallach, 1964, 1967), conceptualizing styles (Kagan, Moss & Sigel, 1963), reflectivity/impulsivity (Kagan, Roseman, Day, Albert & Phillips, 1964), cognitive complexity/simplicity (Bieri, 1966; Harvey, Hunt, & Schroder, 1961; Kelly, 1955), leveling/sharpening (Santostefano, 1971), constricted/flexible control-field articulation (Santostefano & Paley, 1964), tolerance for unrealistic experiences (Gardner, et al, 1959; Klein, Gardner, & Schlesinger, 1962), risk taking/cautiousness (Kogan & Wallach, 1964), and visual/haptic perceptual type (Lowenfeld, 1954; Lowenfeld and Brittain, 1970).

A discussion of the characteristics of each of these dimensions is beyond the scope of this paper. Rather, the reader is referred to the originators of the constructs as indicated above or to Ausburn and Ausburn (1978) and Messick (1976) for summaries of each dimension.

Although there are important differences among cognitive style dimensions, common properties have been identified. One important property of cognitive styles is their stability and generality over time and tasks. Most cognitive styles appear to be consistent for individuals across a variety of tasks sharing a common style-eliciting characteristic. Related to the stability of cognitive styles is the observed general resistance of certain styles to training and change. In particular, the cognitive dimensions of field independence/field dependence, cognitive tempo, and visual/haptic perceptual type appear to be deeply ingrained in individuals (Ausburn & Ausburn, 1978).

An important characteristic of cognitive styles is their apparently minimum relationship with traditional measures of general ability. According to Kogan (1971), cognitive style dimensions refer to the manner and form of cognition, whereas abilities concern level of skill and performance.

Perhaps the most important characteristic of cognitive styles to the field of education is their relationship to a number of specific characteristics, abilities and learning activities as demonstrated by numerous studies. Relationships have been found between cognitive styles, ability and achievement variables, and psychological characteristics. Some of these involve psychological and personality factors, social orientation and perceptual patterns. Other studies indicate relationships between cognitive styles and such learning related activities as memory functioning, reading and verbal skills, inductive reasoning, mathematical ability, and spatial ability (Ausburn, 1978; Kogan, 1971).

The significant properties of cognitive styles, namely, stability and generality over time and across tasks; resistance to training and change; minimum relationship with traditional measures of general ability; and demonstrated relationships to learning tasks make it a vital area of research, a useful construct for instructional design, and potentially important for the development of a theory of instruction in art education.

Of the eleven cognitive styles listed above, the construct of field independence/dependence within Witkin's (1962, 1979) theory of Psychological Differentiation is the most extensively developed, researched, and associated with educational implications. Because of its relative strength as a theoretical construct, the following discussion will explicate the Psychological Differentiation theory and its field-independent/field-dependent dimension and then examine its possible use for research in art education.

Psychological Differentiation

Witkin's construct of Psychological Differentiation has been refined and extended over a period of 30 years, giving it additional strength and confidence as a framework for inquiry into many diverse areas of human behavior. In particular the field-dependent-independent dimension, central to Witkin's earlier differentiation construct, now defined as the extent of autonomous functioning, currently shares its relative position with other phenomena of human behavior: the nature of controls and defenses, and the extent of hemispheric lateralization. Level of differentiation is considered by Witkin to be a broad organismic dimension. There is sufficient evidence to show that

the tendency to function in a more or less differentiated fashion is likely to be evident, to some degree, throughout an individual's psychological and neurophysiological activities.

Differentiation embodies the concept of cognitive style. Witkin et al (1979) define cognitive style as a pervasive dimension of individual functioning in perceptual, personality and social domains, connected in its formation with the development of the organism as a whole. Also, according to Witkin et al, cognitive styles are concerned with the form rather than the content of cognitive activity. Cognitive styles refer to individual differences in how we perceive, think, solve problems, relate to others, learn and create. These individual differences, in Witkin's theory, are described in terms of a bipolar continuum with an articulated (field-independent) cognitive style at one end, and a global (field-independent) cognitive style at the other end. These are believed to be stable over time and not value based (Witkin, et al, 1979).

Initially the terms field-dependent-independent were coined to describe whether the individual used external visual cues (field-dependent) or internal, bodily cues (field-independent) as main referents for locating the upright position. As such, it was considered a perceptual style. Later, these tendencies were found to be related to the ease of separating part of a perceptually organized field from a field as a whole (disembedding process). This ability was subsequently related to structural competence in spatial visualization and intellectual tasks. Extent of the awareness of one's self/body was also found to be related to the field-dependent-independent cognitive style. Basic to all of these abilities, and identified as central to the field-dependent-independent construct is the extent of autonomous functioning.

Recent theoretical revisions (Witkin, et al, 1979) include the addition of three domains: interpersonal behavior, cognitive restructuring, and cerebral lateralization. With these inclusions, the differentiation theory now accounts for an extended network of functions and behaviors responsible for a particular kind of individual self consistency.

Criticism of the Differentiation Construct

Although differentiation is defined as an articulated-global continuum (cognitive style) and is considered bipolar and value free, characteristics of the more articulated dimension (field-independent) are defined much more favorably than those of the global (field-dependent) dimension. Only one characteristic is considered favorable to the field-dependent, namely, greater interpersonal competencies.

Successful performance on field-dependent-independent measurements are all based on the field-independent characteristics. Witkin recognizes this problem and has urged researchers to design instruments that would be more sensitive to field-dependent characteristics as indication of successful performance on the measure. More studies are needed to further define and identify field-dependent characteristics to determine additional areas where they excel and, perhaps, outperform those who are field-independent.

Another weakness in the current differentiation construct is the lack of research on those individuals who fall in the middle of the field-dependent/field-independent continuum. It is not known whether these individuals have more flexible cognitive patterns allowing them to process information differentially, according to the demands of the situation. Related to this weakness is the lack of uniformity in defining the "boundaries" of field-dependent versus field-independent. Research findings are usually applied to the extremes of the continuum.

As more research is conducted using the Witkin construct, some of these weaknesses may be addressed. The strengths of his theory far outweigh the weaknesses. Vernon (1972) suggests that "there is far too much evidence from many sources for psychologists to ignore Witkin's claim that field-dependence-independence is an important dimension of cognition, distinguishable from intelligence and verbal abilities, which has implications for personality, child development, and pathology as well as for thinking and learning." (p. 379)

Behaviors Characteristic of Witkin's Cognitive Style

Witkin's theory, as presented in Figure 1, depicts graphically the main differentiation domains: self-nonself segregation, segregation of psychological functions, and segregation of neurophysiological functions. Each of these domains is further

delineated by specific constructs. Also, each of the domains and constructs is characteristic of the relatively field-independent person.

Basically, the construct of differentiation, as currently conceived, subsumes broad patterns of individual psychological functioning. These patterns include perceptual, intellectual, personality characteristics and interpersonal behaviors. The field-dependent (FD) or field-independent (FI) way of perceiving is one of a large constellation of interrelated characteristics that together reflect a person's style.

These characteristics are grouped under two psychological functions and one neurophysiological function: self-nonself segregation, segregation of psychological functions, and segregation of neurophysiological functions.

The self-nonself segregation has as its basis the extent to which the individual tends to rely primarily on external referents or on the self in psychological functioning. Cognitive restructuring abilities, which also include articulation of body concept, are part of this construct.

Segregation of psychological functions refers to the extent to which the individual uses structured controls over impulse expression and specialized defenses for dealing with potentially disturbing experiences.

Witkin's construct of the segregation of neurophysiological functions is relatively new to his theory and, as such, requires more explanation. This domain is based on the premise that differentiation is a broad organismic construct, therefore, greater or lesser differentiation is expected to manifest itself in the neurophysiological domain as well as in the psychological domain (Witkin, et al, 1979). The evidence suggests that FI compared to FD people show greater lateral specialization of the hemispheres - greater specialization of the left hemisphere for verbal and motor control processing, and greater specialization of the right hemisphere for configurational-gestalt processing. The emphasis is on the degree of lateralization of different types of processing in the respective sides, not on the dominance of one hemisphere over the other as a generalized hemisphericity tendency. There is growing evidence to suggest that the specialization of functions at the neurophysiological level may be an important determinant of psychological functions (Witkin, et al,

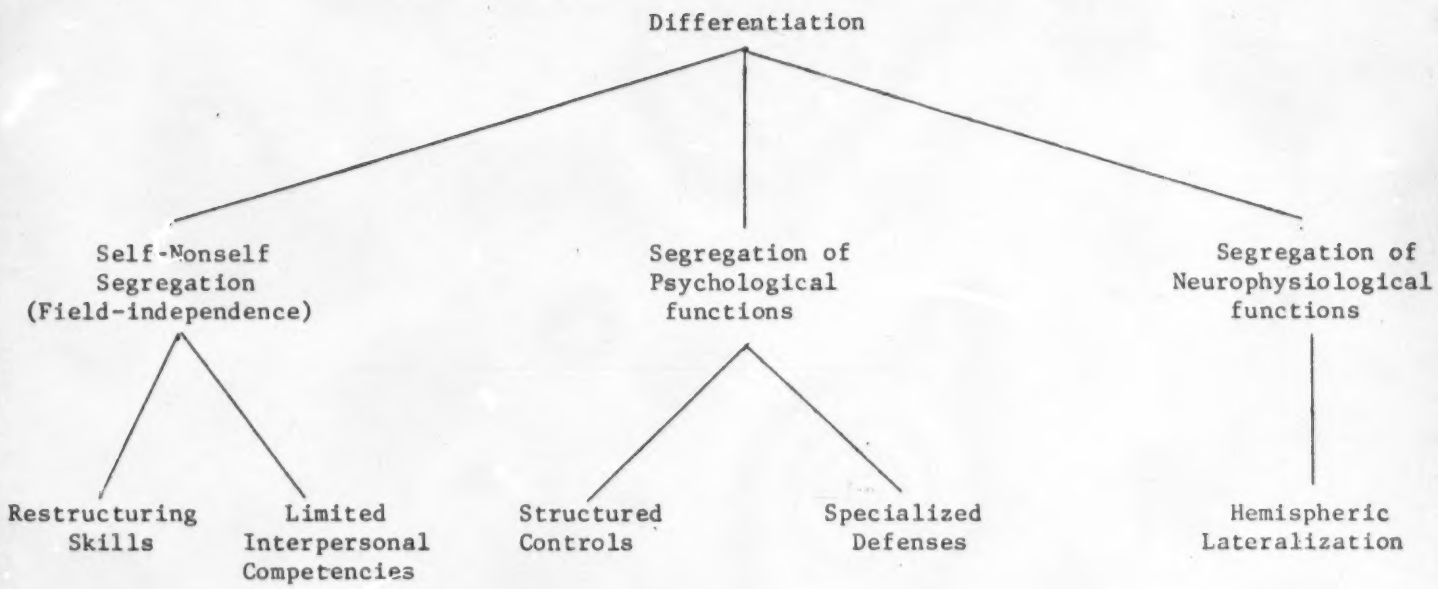

Figure 1: Witkin's Psychological Differentiation Model (1979, p. 1138)

1979).

The right hemisphere, in addition to mediating spatial and configurational processes, may also be implicated in the expression and control of affect (Witkin, et al, 1979).

Numerous research studies have been conducted over the past 30 years using Witkin's Psychological Differentiation theory. Revisions of the theory were made based on the evidence. Finer distinctions emerged regarding individual differences between the relatively FI and FD person. The following list is a selection of the most basic characteristics and behaviors of each dimension.

General Field-Dependent/Independent Behaviors

Relatively Field-Independent (FI) Person	Relatively Field-Dependent (FD) Person
(a) Internalized frame of reference as a guide to self-definition (self-defined goals). Relatively autonomous from external referents. Uses self as referent.	(a) Uses external referents for self-definition; requires externally defined goals and reinforcement.
(b) High spatial restructuring ability.	(b) Lower spatial restructuring ability.
(c) Relatively autonomous interpersonal behavior.	(c) Greater interpersonal orientation and skills.
(d) Greater hemispheric lateralization to the left for verbal processing and to the right for spatial or other configurational stimuli.	(d) More homogeneous hemispheric lateralization.
(e) Sense of separate identity; needs, values are recognized as one's own.	(e) Less sense of separate identity. Takes on values of others more readily.
(f) Experiences body as having definite limits.	(f) Global concept of body.

Structuring Skills

Field-Independent (FI)	Field-Dependent (FD)
(a) Likely to overcome the organization of the field or to restructure it.	(a) Tends to adhere to the organization of the field as given, even when the field lacks inherent organization.
(b) Analysis and structuring are aspects of articulation: person perceives items as discrete from background, when field is organized, or imposes structure when field has little structure.	(b) Involves less intervention mediators such as analyses and structuring. Has difficulty taking an item out of context for restructuring when tasks call for this activity.

Structuring Skills

Field-Independent (FI)	Field-Dependent (FD)
(c) Uses a hypotheses-testing approach (holistic attitude) in problem solving.	(c) Uses intuitive approach determined by salient cues available (partist attitude) in problem solving.

Interpersonal/Social Competencies

Field-Independent (FI)	Field-Dependent (FD)
(a) Impersonal orientation -- not usually sensitive to social concerns.	(a) More attentive to and makes use of prevailing social frames of reference.
(b) Described as cold, distant with others, unaware of their social stimulus value.	(b) Described as warm, affectionate, tactful, accommodating, non-evaluative. Prefer to be physically close to others. More in touch with what others are thinking and feeling.
(c) Individualistic -- more interested in the abstract and the theoretical; prefer more solitary vocations, more abstract in content.	(c) Socially oriented, prefer vocations that are people/service oriented. Attuned to social components in the environment.
(d) Internal frame of reference in dealing with external social referents.	(d) More use of external social referents in defining their attitudes and feelings, especially under conditions of ambiguity.
(e) Experiences self as separated from nonself (others).	(e) More globally experience self.

Effects on Learning

Field-Independent (FI)	Field-Dependent (FD)
(a) Learns more than FD with intrinsic motivation. Differences disappear with external rewards.	(a) Better at learning material with social content. Better at picking up social cues.
(b) Self-defined goals and reinforcement.	(b) Externally defined goals and reinforcement.
(c) Likely to analyze a field when the field is organized or impose structure on a field lacking organization.	(c) Tends to take field as is -- without using mediational processes such as analyzing and structuring. More difficulty in learning unorganized material.
(d) Takes an active role/approach in learning.	(d) Takes a more passive or spectator role in learning.
(e) Tends to sample more fully from array of cues available.	(e) Tends to ignore some attributes/cues.

Effects on Learning

Field-Independent (FI)	Field-Dependent (FD)
(f) Tends to learn more rapidly from abstract cues.	(f) Tends to learn more rapidly from salient cues.

Areas/Situations of No Difference Between FI and FD

(a) No appreciable difference in learning ability or memory.

(b) When learning organized material, both FD and FI learn equally well.

(c) No difference when material and social rewards are offered.

(d) No significant differences in the number of trials required to learn a concept; however, the process of learning differs.

(e) No significant difference between FD and FI in academic achievement at the college level.

(Witkin, et al, 1977; 1979)

Cognitive Style and Artistic Behavior

It is clear from the above discussion that FI and FD cognitive styles are contrasting strategies for processing information. The principal difference is that relatively FI persons are more likely to use internal referents as primary guides in information processing; relatively FD persons use more external referents. Characteristic behaviors are closely related, and emerge from, these central tendencies. Inferences can be made regarding these behaviors and their manifestations in art processes.

Structuring/Restructuring Skills

Although FD and FI persons do not appear to differ with regard to the immediate precept induced by most stimuli, FI people seem better able than FD people to achieve a different precept when required by situational demands or inner needs, through restructuring of their initial perceptual experience -- at least for spatial-configurational materials. This would encompass problems which require manipulation of figural material in the visual modality, relevant in artistic processes, such as: imagining the way objects change as they move in space; maintaining orientation with respect to objects in space; keeping configurations in mind; finding the Gestalt among disparate parts;

and structuring elements in space (Witkin & Goodenough, 1980). Other visual-spatial tasks, related to artistic processes and development, in which FI usually perform better than FD, include perceptual constancy, speed of closure, functional fixity, set breaking, and the Piagetian tasks of conservation, representation of the horizontal coordinate and perspectivism. (Witkin & Goodenough, 1980).

Witkin (1976) also found that people competent in spatial restructuring (FI) tend to adopt an hypothesis-testing approach in visual discrimination learning, signifying a participant role in learning. People who do less well on spatial restructuring (FD), tend to respond to salient stimulus attributes of the visual, indicating a more passive role in learning.

Structuring Skills and Art Production

Art production involving reproducing three-dimensional visual objects in space (still life, landscapes, figures) on a two-dimensional surface is a restructuring task. If the stimuli are organized, it would appear that most students would succeed in the task. If the stimuli are not organized and/or are visual and spatially complex, FI students would probably perform at a higher level than FD students. Two studies by the author seem to confirm this hypothesis.

A recent pilot study on comparing cognitive style and drawing instructional strategy of eighth grade art students (see note 1) showed that FD did less well on spatial organization and restructuring of objects in drawings of complex still life as compared to FI. However, FD did comparatively well on drawing tasks in which the field was organized and less complex.

In an earlier study (Lovano, 1970) on the relationship between cognitive style and graphic expression of boys in grades 2nd. through 6th., a close relationship was found as well as self consistency across a series of drawing tasks, some of which had visual stimuli, some of which did not. Differences in the graphic expressions of children of the same age appeared to reflect differences in their modes of information processing. This suggests that, for the grade levels studied, an individual's propensity for an analytic (FI) or global (FD) mode of experiences is evident in his/her drawings. Graphic expressions of the FI boys had more structure, more details, and greater spatial

relationsnips than the FD. Also, body concept drawings of FI were more sophisticated regarding articulation of parts to the whole, details, and identifying features.

Many questions remain regarding the relationship of cognitive style, in particular the restructuring construct, and art production. One area of inquiry could be the differences in art production processes and products resulting from the tendency for FD persons to use an intuitive approach and salient cues in visual problem solving, as contrasted with the tendency for FI to use a hypothesis-testing approach, to attend more analytically, and to sample more fully from visual arrays in problem solving.

Other areas of interest to art educators in need of inquiry in relation to cognitive style and art production were mentioned earlier in this section: perceptual constancy, functional fixity, finding the Gestalt among disparate parts, and maintaining orientation with respect to objects in space.

Social Competencies and Art Production

Field-dependent individuals tend to excel in interpersonal and social competencies as compared to FI persons. They are more socially oriented and prefer interpersonal situations in which they are involved with others; they are more attentive to material with social content; and they are more likely than FI persons to make use of external, social frames of reference in defining their attitudes, particularly under conditions of ambiguity. Conversely, FI persons tend to prefer more solitary, impersonal situations and are more insensitive to social cues, more individualistic, and more concerned with ideas and with the abstract, the theoretical. They tend to use an internal frame of reference in dealing with external social situations.

The implications of these social tendency orientations for art education, in particular art production and instruction, are evident, as is the need for inquiry in this area. Some questions for study might be: To what extent does social tendency orientation affect choice of subject matter, mode of expression, and approach to problem solving? What effect does an art problem based on abstract concepts have on the art production of FD persons? What effect does an art problem based on social content have on the art production of FI persons? To what extent does social tendency orientation affect group interactions and the resulting group art projects? What are the most

effective instructional strategies for each orientation?

Hemispheric Lateralization and Art Production

Recent knowledge regarding asymmetrical specialization in the hemispheres of the brain has made it possible for Witkin et al to formulate explicit hypotheses within the differentiation theory in reference to linkages between psychological and neurophysiological differentiations. The evidence suggests that the left and right hemispheres have characteristically different modes of processing information (Dimond & Beaumont, 1974; Milner, 1975). The left hemisphere, served most directly by the right visual field and right ear, seems particularly suited to the processing of verbal-conceptual and executive motor functions, while the right hemisphere, served most directly by the left visual field and left ear, has been characterized in ways that imply holistic processing of configurations or Gestalten (Bogen, 1975).

Using a composite face-perception technique, Oltman, Ehrlichman, and Cox (1977) found a significant tendency for relatively FI subjects to show a stronger left visual field bias than did FD subjects. Hence, with a task more suited to the processing mode of the right hemisphere, FI subjects gave particular weight to cues from the left visual field, which project to the right hemisphere, while FD subjects showed little or no lateralization on this task.

Witkin's theory with regard to cerebral specialization suggests that greater differentiation manifests itself in clear separation between affect and ideas or percepts. Furthermore, Witkin et al (1979) speculate that, "If there is a special role for the right hemisphere in affective experience and expression, we might then ask whether greater or less cerebral lateralization may enter into determining how affect and ideation are interrelated. It is perhaps possible that one of the bases for the relative lack of separation of feelings and ideas among less differentiated people is a neural organization in which parts of the brain ordinarily involved in their processing are not as specialized for these purposes." (p. 1140) Such a possibility seems consistent with Witkin's differentiation theory and is capable of generating testable predictions for research on art processes.

Some basic questions relevant to both art production and art criticism might

be: What aspects of a visual array are being processed and what forms do the responses take? Are there qualitative and quantitative differences in art performance related to cognitive style?

Many of the questions posed earlier in this discussion are also applicable to this section because of the pervasiveness in psychological differentiation of neurophysiological functioning.

Cognitive Styles and Art Criticism

The question of the effect of individual cognitive style on art criticism has only recently been examined (Savarese & Miller, 1979). Many questions still remain. In particular, the forms of information processing and the related social behaviors, restructuring abilities and interpersonal competencies in Witkin's theory suggest that art preference may be a function of the relationship between art style/theory, and cognitive style more than other variables examined in past research. Relatively FD persons may be responding favorably to works of art with social and expressive content, and making preference decisions on the basis of intuition and salient cues. On the other hand, relatively FI persons may be responding favorably to works of art with abstract and ideational content and/or those requiring an analytical or restructuring (if ambiguous) approach. Similarly, the various approaches to art criticism and aesthetic perception may be favoring one mode of processing information over the other. The emphasis on analysis of parts to the whole, restructuring, and hypotheses-testing may exclude persons with a global style (FD). Conversely, approaches focusing on mood, feeling, and intuition may exclude persons with a more articulated style (FI). A better understanding of these possible influences in responding to art could be basic to instructional development, teaching and learning.

Implications for Art Teaching and Research

The previous discussion has focused primarily on the learner in relation to cognitive style and art processes. Since much of learning takes place in formal settings, the relationship of the teacher's cognitive style in interaction with the student's should be considered. Also, the question of the relationship of cognitive style and career choice in education, especially art education, bears scrutiny.

The behaviors specific to each cognitive style suggest a possible correspondence between cognitive style, education, and career choice - in particular, teaching. This relationship was investigated in a comprehensive, longitudinal study by Witkin, Moore, Oltman, Goodenough, Friedman, Owen and Raskin (1977). Witkin et al predicted that "relatively field-dependent people will show interest in domains which are primarily social in content, require interpersonal relations for their conduct, and do not particularly call for cognitive restructuring skills. On the other hand, more field-independent people are likely to favor domains which emphasize cognitive restructuring skills, are primarily abstract and nonsocial in content, and tolerate an impersonal orientation." (p. 199) Three major groups were identified: one group consisted of the natural sciences and mathematics - designated as the Science Group; the second group of majors consisted of elementary education, early childhood education, speech therapy, and nursing - designated as the Education Group; the third group consisted of disciplines which were designated as Other since it was broad-gauged in that there existed within them opportunities for either field-dependent or field-independent persons. Psychology, with clinical-personality-social areas at one of its poles and the experimental-psychophysiological-mathematical areas at its other pole, is an example of this group. Interestingly, art and music majors were found to be by far the most field-independent group within the Other category. Also, the results of the study showed that, over time, students tended to abandon fields which were incompatible with their cognitive style and shift to fields which were compatible. The most field-independent shifters tended to enter art, music, and science, while the most field-dependent shifters tended to enter education and the humanities.

Since a career choice of art education indicates an interest in the visual arts and in education, it is probable that both cognitive styles are represented in any sample of art educators. However, there is some preliminary evidence (Lovano-Kerr, note 2) indicating a greater tendency for art education undergraduate students to be more field-independent than elementary education undergraduate students. Some implications of these findings for art teaching behaviors and learning strategies can be derived from existing literature.

In the area of teaching behaviors, field-independent teachers were expected to exhibit strong control or impersonal behavior patterns. Field-dependents were expected to be more democratic and personal in their interactions with students. These expectations were generally confirmed by Moore (1973), who found that field-independent teachers used questions more frequently than field-dependent teachers. Also, field-dependent teachers' questions were oriented toward personal understandings, whereas field-independent teachers' questions were content-related.

Field-dependent and field-independent persons differ in characteristic behaviors in such areas as social learning, reinforcement, use of mediators and cue salience. These individual differences affect the teaching-learning process.

A number of studies (Adcock & Webberley, 1971; Fitzgibbons, Goldberger & Eagle, 1965; Messick & Damarin, 1964; and Ruble & Nakamura, 1972) have demonstrated that field-dependent subjects were more adept at utilizing social cues and at attending to and recalling social content. In the area of reinforcement, intrinsic reward structures were found to be more effective for field-independent learners, although no differences were observed when social or extrinsic rewards were used (Paclisanu, 1970; Ruble & Nakamura, 1972; Steinfeld, 1973).

Other studies (Koran, Snow, & Mc Donald, 1971; Renzi, 1974; Schwen, 1970; Sego, 1974) have shown that highly structured learning materials tended to benefit field-dependent subjects, whereas less structured or less obvious goal-directed materials tended to benefit field-independent subjects.

Field-dependent and field-independent subjects were found to have quite different perceptual search strategies (Ruble & Nakamura, 1972; Zawel, 1970). These studies suggest that field-independent individuals learn concepts when both obvious (salient) and less obvious (less salient) cues are involved. Field-dependent subjects are bound by the stimulus field and learn best from salient cues.

These findings and those in other sections of this paper suggest plausible teaching-learning strategies in art as well as a possible basis for developing a theory of instruction in art education. Moreover, they indicate an area for research long overdue in the field of art education. Witkin's cognitive style construct, by virtue of

its comprehensiveness and strength might provide the theoretical framework needed for greater insights into art processes and behaviors.

Notes

Note 1: A series of pilot studies was conducted by the author for the purpose of testing assumptions derived from specific constructs of the differentiation theory. This specific study involved examining the relationship of cognitive styles and drawing behaviors of eighth grade students.

Note 2: This study was one of a series of pilot studies using the differentiation construct conducted by the author. Specifically, this research sought to determine whether there was a relationship between art preference and cognitive style. Also, it looked at the differences in cognitive style between art education majors and elementary education majors.

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